

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte NORBERT KOHLER,
JACQUES JARRIN, PIERRE REYNES,
and ARNAUD MESSENGER

Appeal 2007-2414
Application 10/030,222
Technology Center 1700

Decided: November 28, 2007

Before EDWARD C. KIMLIN, CHARLES F. WARREN, and
THOMAS A. WALTZ, *Administrative Patent Judges*.

WARREN, *Administrative Patent Judge*.

DECISION ON APPEAL

Applicants appeal to the Board from the decision of the Primary Examiner finally rejecting claims 2 through 6, 8 through 11, and 21 through 23 in the Office Action mailed February 23, 2006 (Office Action).
35 U.S.C. §§ 6 and 134(a) (2002); 37 C.F.R. § 41.31(a) (2006).

We reverse the decision of the Primary Examiner.

Claims 3 and 9 illustrates Appellants' invention of a method intended for thermal insulation using vegetable foam particles and an installation comprising vegetable foam particles, and are representative of the claims on appeal:

3. A method intended for thermal insulation, comprising filling a volume defined by the space contained between a first enclosure interior to a second enclosure with vegetable foam particles having a thermal conductivity ranging between 0.03 and 0.06 W/m. °K, solubilizing said vegetable foam particles by an aqueous fluid, and free pulling said first enclosure.

9. An installation comprising a first enclosure placed in a second enclosure, characterized in that the space contained between said enclosures comprises a volume of vegetable foam particles used as a thermal insulant, wherein said vegetable foam particles have the following properties: thermal conductivity ranging between 0.03 and 0.06 W/m. °K and at least partial solubility in an aqueous fluid.

The Examiner relies upon the evidence in these references of record (Answer 3-4):

Boehmer	US 5,272,181	Dec. 21, 1993
Tomka	US 5,705,536	Jan. 6, 1998
Beauquin	US 5,858,489	Jan. 12, 1999

Appellants request review of the ground of rejection of 2 through 6, 8 through 11, and 21 through 23 under 35 U.S.C. § 103(a) as unpatentable over Beauquin in view of Boehmer and Tomka.¹ Br. 4 and

¹ On this record, we are of the opinion that this is in fact the ground of rejection before us for review. Indeed, the Examiner relied on Tomka in two Office Actions before the Answer, in effect twice rejecting the appealed claims on the combination of Beauquin, Boehmer, and Tomka; and Appellants considered Tomka in a Request for Reconsideration before the Answer as well as in the Brief and Reply Brief and have not filed a petition objecting to the Examiner's action. Thus, Appellants have been accorded

7-8; Reply Br. 2; Ans. 3 and 6.

The issue in this appeal is whether the Examiner has carried the burden of establishing a prima facie case of obviousness in the ground of rejection advanced on appeal.

The plain language of claims 3 and 9 specify vegetable foam particles solubilized by an aqueous fluid in an enclosed space, wherein the particles are thermally insulative and have a thermal conductivity ranging between 0.03 and 0.06 W/m. °K.

We find Beauquin would have disclosed to one of ordinary skill in this art, with reference to Beauquin's Fig., a system for thermal and/or acoustic insulation of a production string or tube 10, for outflow of hydrocarbons from a well, wherein annular space 24 between jacket 26 and tube 10, sealed at the well end by seal 20 and at the well head 14, is filled with an aerogel as the thermal and/or acoustic insulator. Beauquin, e.g., col. 1, ll. 6-46, col. 2, ll. 41-63, and col. 3, ll. 8-35. The aerogel can be prepared with sodium silicate or tetraethylorthosilicate and can be inserted into annular space 24 as a preformed aerogel sleeve or can be entirely or partially prepared in situ therein. Beauquin, e.g., col. 3, l. 37 to col. 8, l. 2. Beauquin acknowledged it was known to use a liquid loaded with solid particles or a

due process in this matter. In these respects, the record shows that the statement of the ground of rejection in the Office Action and the Answer includes only Beauquin and Boehmer. However, in the Office Action, the Advisory Action mailed June 13, 2006, and the Answer, the Examiner cites and relies on Tomka to support the ground of rejection. Office Action 2-3; Advisory Action 2; Ans. 6. In the Request for Reconsideration filed May 23, 2006, Appellants stated the ground as including Beauquin, Boehmer, "(and . . . Tomka)," and submitted argument with respect to Tomka. Request for Reconsideration 2 and 5. Appellants further argued Tomka in the Brief and Reply Brief. Br. 7-8; Reply Br. 2.

liquid gel between the two walls of a double jacketed tube, but the “thermal insulation performance is mediocre because of the high residual conductivity of the medium, which is of the order of 0.6 W/m. °C, when it is based on water and of the order of 13 W/m. °C. when it is based on hydrocarbons.” Beauquin col. 2, ll. 1-23.

We find Boehmer would have disclosed, to one of ordinary skill in this art, biodegradable expanded foam materials prepared from a starch-graft copolymer, grain based starch containing materials and water formulation which is expanded, with or without a blowing agent, in, among other things, an extruder, which is used to form expanded foam articles such as, among other things, packing material, such as loose fill packing, and foam sheeting. Boehmer, e.g., Abstract, col. 2, l. 32 to col. 3, l. 29, col. 3, l. 37, to col. 6, l. 38. Boehmer describes the biodegradability of the foam materials as retaining “shape and compressibility under *non-wetted conditions but disintegrates to a pulverous amorphous mass when subjected to a continuous liquid water phase*” and “is thus rapidly integrated into the upper soil layer if discarded upon soil or if placed in a subsurface layer of a landfill.” The foam materials “may be disposed of in a wastewater treatment system” capable of biological degradative treatment. Boehmer col. 2, ll. 44-55 (emphasis supplied); *see also*, e.g., col. 4, ll. 64-68, and col. 5, l. 55 to col. 6, l. 8. The starch-grafted copolymer “may be prepared using any starch or starch containing grain base” and is used along with additives, such as plasticizers, including glycerol, and starch filler materials having any combination of amylose and amylopectin. Boehmer, e.g., col. 3, l. 37 to col. 4, l. 46.

We find Tomka would have disclosed to one of ordinary skill in this art a substantially biodegradable foamed starch polymer prepared from a thermoplastic or disaggregated starch, a polymer mixture of such starch, and at least one biodegradable hydrophobic polymer which is foamed under temperature and pressure. Tomka, e.g., Abstract, col. 1, ll. 3-7, and col. 2, l. 34 to col. 6, l. 39. The thermoplastic starch can contain a plasticizing agent, such as glycerol, and can be mixed with such hydrophobic polymers as cellulose derivatives. Tomka, e.g., col. 3, l. 6, to col. 4, l. 41. The biodegradable foamed polymer can be used for packaging material and as thermal or acoustic insulation. Tomka, e.g., col. 6, ll. 40-44. Tomka acknowledges that foamed polymers which are not biodegradable are known for such uses as packaging and thermal and acoustic insulation. Tomka col. 1, ll. 9-21.

The Examiner determines that the teachings of Beauquin do not disclose filling annular space 24 with vegetable foamed particles. Ans. 3. The Examiner finds Boehmer would have taught expanded vegetable foam material solubilized by an aqueous fluid “for the purpose of being able to be placed on the subsurface layer of a landfill or to be disposed in a wastewater treatment system having facilities for biological or other types of degradative treatment.” Ans. 4, citing Boehmer col. 2, ll. 50-55. The Examiner concludes it would have been obvious “to provide Maxson [sic, Beauquin] with expanded foam material” taught by Boehmer because it is biodegradable. Ans. 4. The Examiner further concludes it would have been obvious to provide vegetable foam having a thermal conductivity range as claimed as it involves discovering the optimum value by routine experimentation. Ans. 4.

The Examiner contends Boehmer's foam material is inherently insulative and is known in the art to have other uses in addition to packaging, pointing to Tomka's teachings as support for the proposition that biodegradable polymers are known to be useful as packaging and thermal and acoustic insulation. Ans. 6, citing Tomka col. 1, ll. 14-16. The Examiner relies on Tomka to support the conclusion that it would have been obvious to "provide Beauquin whose invention is directed to thermal and acoustic insulation with the biologically degradable polymer foam taught by Boehmer." Ans. 6, citing Boehmer col. 2, ll. 45-49. The Examiner further relies on Tomka to support "the motivation of using biologically degradable polymer foam . . . for acoustic insulation," and it would have been obvious to provide Boehmer's biologically degradable polymer foam to Beauquin. Ans. 6.

It seems to us that the Examiner is relying on the disintegration of Boehmer's biodegradable expanded foam articles in a liquid water phase from landfill and wastewater treatment degradation to obtain the claimed vegetable foam particles solubilized in an aqueous fluid. At the same time, the Examiner relies on the general use of the non-biodegraded, whole expanded foam articles of Boehmer as thermal and acoustic insulative material, as suggested by Tomka. The Examiner's reliance in these respects is misplaced as the combination of Boehmer and Tomka does not disclose or suggest a thermal conductivity range for the whole expanded foam article and clearly not for the foam particles which result from degradation of the whole article. Thus, there is no evidence in the combined teachings of the applied references which would have taught or suggested to one of ordinary skill in the art that the solubilized foam particles resulting from the

biodegradation of the expanded foam articles in landfill and wastewater treatment systems can provide the thermal insulation sought by Beauquin. To the contrary, as Appellants point out, Beauquin provides evidence that water loaded with solid particles provides mediocre thermal insulation on the order of 0.6 W/m. °C. which is outside of the claimed range. Reply Br. 2-3, citing Beauquin col. 2, ll. 6-28; *see above* p. 4.

The Examiner advances no other reason why one of ordinary skill in this art would have been motivated to substitute the water solubilized solid foam particles resulting from the landfill and waste-water treatment degradation of Boehmer's whole expanded foam articles for Beauquin's aerogels in annular space 24 to thermally and/or acoustically insulate production string or tube 10 with the reasonable expectation of arriving at the claimed method and claimed article encompassed by representative claims 3 and 9.

In the absence of scientific reasoning or evidence establishing that one of ordinary skill in this art would have been motivated to exchange Beauquin's aerogel with the claimed solubilized foamed particles having a particular thermal conductivity range with a reasonable expectation of successfully providing insulation that is the same as or similar to that provided by Beauquin's aerogel, we determine that the Examiner has not established a *prima facie* case of obviousness. *See, e.g., In re Rouffet*, 149 F.3d 1350, 1358 (Fed. Cir. 1998) ("hindsight" is inferred when the specific understanding or principal within the knowledge of one of ordinary skill in the art leading to the modification of the prior art in order to arrive at appellant's claimed invention has not been explained); *In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992) ("The mere fact that the prior art may be

modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification.”); *In re Dow Chem. Co.*, 837 F.2d 469, 473 (Fed. Cir. 1988) (“The consistent criterion for determination of obviousness is whether the prior art would have suggested to one of ordinary skill in the art that [the claimed process] should be carried out and would have a reasonable likelihood of success viewed in light of the prior art. Both the suggestion and the expectation of success must be founded in the prior art, not in the applicant’s disclosure.” (citations omitted)); *see also See KSR Int’l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1741 (2007) (“it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does”). Accordingly, we reverse the ground of rejection under 35 U.S.C. § 103(a) advanced on appeal.

The Primary Examiner’s decision is reversed.

REVERSED

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